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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

I. Prior Art

Reference is made to the following documents:

D1: JEONG J ET AL: 'Adaptive Huffman coding of 2-D DCT coefficients for image sequence compression' SIGNAL PROCESSING. IMAGE COMMUNICATION, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 7, no. 1, 1 March 1995 (1995-03-01), pages 1-11, XP004047118 ISSN: 0923-5965

D2: VON RODEN T: 'H.261 and MPEG1-a comparison' COMPUTERS AND COMMUNICATIONS, 1996., CONFERENCE PROCEEDINGS OF THE 1996 IEEE FIFTEENTH ANNUAL INTERNATIONAL PHOENIX CONFERENCE ON SCOTTSDALE, AZ, USA 27-29 MARCH 1996, NEW YORK, NY, USA,IEEE, US, 27 March 1996 (1996-03-27), pages 65-71, XP010158346 ISBN: 0-7803-3255-5

D3: LLADOS-BERNAUS R ET AL: 'Codeword assignment for fixed-length entropy coded video streams' DATA COMPRESSION CONFERENCE, 1998. DCC '98. PROCEEDINGS SNOWBIRD, UT, USA 30 MARCH-1 APRIL 1998, LOS ALAMITOS, CA, USA,IEEE COMPUT. SOC, US, 30 March 1998 (1998-03-30), pages 269-278, XP010276625 ISBN: 0-8186-8406-2

II. Novelty & Inventive Step

The present application meets the requirements of Article 33(1) PCT, because the subject-matter of claims 1-11 is new in the sense of Article 33(2) PCT and involves inventive step in the sense of Article 33(3) PCT (see however under VIII).

None of the prior art documents describes the specific assignment of run-length code words as used (decoding claims 4,8). As there is no hint in the prior art for such an

assignment, the subject-matter of a clarified set of claims 1-11 is considered to novel and involve inventive step.

However (see also under VIII) the subject-matter of claim 12 is considered to be anticipated by any data disk.

IV. Industrial Applicability

The subject-matter of claims 1-12 meets the requirements of Article 33(4) PCT because it is industrially applicable in the field of subtitles.

Re Item VII

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 are not mentioned in the description.

2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VII

Article 6 PCT

The definition of the range of runlengths as used in the 2nd step of claim 1 is unclear because, this defined range does not appear to have any technical meaning. In fact it is only stated in claim 1 that in two cases said defined range is exceeded. Looking at figure 3 it appears as if a first range might be meant (L<63), but surely in the other cases mentioned in claim 1, L<16384.

The wording of claims 1 and 4 is inconsistent. While it is quite clear from claim 4 how the assignment of code words actually looks like, the person skilled in the art is quite clueless with regard to claim 1. Other than that two or three bytes are used for encoding a first color, and one, three or four bytes are used for encoding a 2nd color, no information is given to the structure of the encoded data (e.g. color information, which bytes and which bits are set).

Similar issues concerning the clarity and inconsistencies apples to claim 7

The subject-matter of claim 12 is unclear because based on the data on a disc its encoding process cannot be deduced.

Claims

1. A method for run-length encoding of a data stream, the data stream comprising bitmap formatted subtitle or menu data for video presentation on a display, wherein the subtitle or menu data include graphics or text or both, comprising the steps of
   - defining a preferred color;
   - defining a range of run-lengths;
   - encoding pixels of the preferred color to first code words with two or three bytes, wherein said first code words comprise a run-length value, and wherein the run-length value comprised in first code words having three bytes exceeds said defined range and may exceed the width of the display;
   - encoding pixels of another than the preferred color to second code words with one, three or four bytes, wherein the second code words comprise a color value, and wherein second code words having three or four bytes comprise a run-length value, and wherein the run-length value comprised in second code words having four bytes exceeds said defined range and may exceed the width of the display.

2. Method according to claim 1, wherein said color values and the preferred color are mapped with a look-up table to display colors.

3. Method according to claim 1 or 2, wherein the shortest redundant code word is used for line synchronization.

4. Method for run-length decoding of an encoded data stream for a video presentation on a display, comprising the steps of

- determining the first byte of a code word;
- if said first byte has not a defined first value, decoding said first byte to a single pixel having individual color defined by the value of said first byte, the color being other than a defined first color;
- if said first byte has the defined first value, determining the first and second bit of the following byte being the second byte;
- if the first and second bit of the second byte have a first value, decoding the remaining bits of the second byte to a sequence of pixels of the defined first color, wherein said remaining bits of the second byte define the sequence length;
- if the first and second bit of the second byte have a second value, decoding said remaining bits of the second byte together with the following third byte to a sequence of pixels of the defined first color, wherein said remaining bits of the second byte and said third byte define the sequence length, and wherein said sequence length may exceed the display width;
- if the first and second bit of the second byte have a third value, decoding said remaining bits of the second byte together with the third byte to a sequence of pixels, wherein said remaining bits of the second byte define the sequence length and the third byte defines the pixels color; and
- if the first and second bit of the second byte have a fourth value, decoding said remaining bits

of the second byte together with the third and a following fourth byte, wherein said remaining bits of the second byte and the third byte define the sequence length and the fourth byte defines the pixel color, and wherein said sequence length may exceed the display width.

5. Method according to the previous claim, wherein said defining of a pixel color from the first, third or fourth byte and from said first value comprises using a look-up table.

6. Method according to claim 4 or 5, wherein the encoded data stream for a video presentation is a separate layer overlaying other video data on the display, further comprising the step of selecting a portion of said separate layer for displaying.

7. An apparatus for run-length encoding of a data stream comprising bitmap formatted subtitle or menu data for a visual presentation on a display, wherein the subtitle or menu data include graphics or text or both, comprising

- means for defining a first color;
- means for defining a range of run-lengths;
- means for encoding pixels of the first color to first code words with two or three bytes, wherein said first code words comprise a run-length value, and wherein the run-length value comprised in first code words having three bytes exceeds said defined range and may exceed the width of the display;

- means for encoding pixels of another than the first color to second code words with one, three or four bytes, wherein the second code words comprise a color value, and wherein second code words having three or four bytes comprise a run-length value, and wherein the run-length value comprised in second code words having four bytes exceeds said defined range and may exceed the width of the display.

8. An apparatus for run-length decoding of an encoded data stream containing compressed bitmap formatted subtitle or menu data for video application, comprising

- means for determining code word length, wherein the first byte of a code word is evaluated, and wherein if said first byte has another than a defined first value then said code word length is determined to be one byte, and otherwise the first and second bit of the following, second byte are evaluated, and depending on said first and second bit the code word length is determined to be two, three or four bytes respectively;
- means for decoding code words determined to be one byte long to single pixels having a color defined by said one byte, the color being different from a defined first color;
- means for decoding code words determined to be two bytes long to sequences of pixels of the defined first color, wherein the sequence length is defined by the remaining bits of the second byte of the code word;

- means for decoding code words determined to be three bytes long either to sequences of pixels of the defined first color, wherein the sequence length may exceed the width of the video display and is defined by the third byte and the remaining bits of the second byte, or to sequences of pixels of equal color other than the defined first color, wherein the sequence length is defined by the remaining bits of the second byte; and
- means for decoding code words determined to be four bytes long to sequences of pixels of equal color other than the defined first color, wherein the sequence length may exceed the width of the video display.

9. Apparatus according to the previous claim, wherein the means for decoding code words having two bytes that include a sequence length of zero as a sync code word, further comprising means for decoding said sync code word to an end-of-line indication.

10. Apparatus according to any of the claims 7-9, further comprising look-up table means for mapping between said color values, including said defined first color, and display colors.

11. Apparatus according to any of claims 7-10, wherein said encoded data stream is distributed to multiple transport packets.

12. Disc containing data encoded according to any of the claims 1-3.

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